

Master of Science in Applied Computer Science

The Master of Science with major in Applied Computer Science for Experienced Professionals (MSACS) is a thirty-six hour graduate degree program. Coursework in the following areas will be included: Embedded Systems Computing Systems Software Engineering Principles N-tier Client/Server Systems Parallel & Distributed Systems Distributed Object Technology. The MSACS is perfect for working professionals with industry experience in computing and information technology interested in obtaining a graduate degree in computer science, concurrent with work commitments. Courses will be offered in a cohort/learning-community allowing students to complete the program in 22 months (5 semesters including a summer semester). The program is approachable for students with modest technical backgrounds, and does not require an undergraduate degree in computer science. Graduates will be awarded certifications in Embedded Systems and a chosen professional certification.

Web-Based Instruction Delivery

Classes will meet in person and on-campus only every third week. Instruction will be delivered using web-based technologies for the other class meetings, supplemented by study group teams, and ad-hoc meetings. Lectures will be delivered using synchronous distance learning technology over the web, where students attend class over the web at an assigned time, or view the archived lecture at their convenience. Real-time interaction between the students and professor will be supported using online “chat” facilities and white-board. The use of distance-learning technology and staggered on-campus meetings is intended to accommodate “non-traditional” students balancing work with graduate study.

Individual Lab Equipment

The non-traditional technology-based instruction delivery component of the MSACS program requires that students have off-campus access to laboratory components. Courses with

hardware-specific lab experiments (embedded systems) will be conducted using hardware and equipment issued to each student for home and off-campus use. In addition, the CSIS department maintains a faculty development and graduate student resource room with laboratory equipment available for student use.

General Requirements for Admission to the MSACS Program

1. An undergraduate degree from an accredited institution is required. The program is open to various majors with appropriate backgrounds who can master the foundations, and is not restricted to undergraduate degrees in science and engineering.
2. Minimum cumulative undergraduate adjusted GPA of 2.75 on a 4.0 scale.
3. Experience in the computing industry is required. This can include both part-time and full time experience.
4. Coursework in the following prerequisite foundations are required:
 - a. applied calculus
 - b. physics
 - c. computer programming
 - d. computer architecture
 - e. data structures

Work experience and other coursework can selectively replace certain prerequisite knowledge foundations at the discretion of the program director with demonstration of student competency in the knowledge area.
5. Official GRE test scores. Although no minimum score is required, the applicant's GRE score will be considered in the competitive review process.
6. Other criteria will be considered by the MSACS Admissions Committee for applicants, including:
 - course work
 - major area coursework GPA
 - professional certifications in computing areas
 - relevant work experience
 - professional activities

7. International Students must submit a minimum TOEFL score of at least 600 to be considered for admission.
8. Valid Immunization Certificate for measles, mumps, and rubella.

Grades in Graduate Courses

Expectations for satisfactory graduate level student performance are detailed in Academic Policies section of this catalog.

Petition to Graduate

Each MSACS candidate must petition to graduate at least one semester prior to completion of program requirements. The student must contact the MSACS program office and request a petition. Applications should meet with their advisor or the MSACS director and complete a graduation checklist prior to submitting their petition to the KSU registrar's office.

Financial Information for MSACS Program

A. Premium Pricing

The MSACS is a Premium Program that includes many expensive premiums that require premium tuition. The cost of the program is \$5000 per semester for each of five semesters for \$25,000 total. This tuition includes fees, books and class materials, access to lectures using distance learning technology, a graduation banquet and hooding ceremony, and other premium features currently including: a laptop PDA, digital logic lab kit including microprocessor and components, membership in the Association for Computing Machinery (ACM), and a professional certification program, and optional research project.

B. Financial Aid

All MSACS applicants are encouraged to apply for financial aid in the event of an emergency that could prevent them from fulfilling their commitment to the program.

C. Fee Schedule and Deadlines

Tuition is prorated over the length of the program, with a payment of \$5000 due on or before the first day of class for each of the five semesters. In addition, a \$250 deposit is due upon official notification of acceptance to the MSACS in order to reserve a place in the program. This deposit is a component of the first semester’s tuition, leaving a remaining balance of \$4750 due on or before the first day of class for the first semester.

D. Payment of Fees

Methods of Payment

Payment of this fee and the \$5000 semester tuition fee can be made by check, credit card (VISA, MasterCard or Discover), or cash.

- Checks are sent to the Kennesaw State University, Bursar’s Office, 1000 Chastain Road, MB #0503, Kennesaw, GA 30144-5591.
- Credit card payments are made by contacting the Bursar’s Office at 770-499-3294.
- Cash payments must be made at the Cashier’s Window in the Student Center.

If Tuition is Paid by Company (Third Party Payment)

In most instances, a company will not pay tuition until after grades are assigned. To set up this method of payment, the student must request the company to send a Letter of Authorization the Bursar’s Office, Kennesaw State University, 1000 Chastain Road, Kennesaw, GA 30144-5591, at the beginning of the semester. The letter must include the following information:

- Student’s name and social security number for whom tuition will be paid;
- Semester for which tuition will be paid;
- Amount of tuition that the company will pay;
- Copy of page(s) from Human Resource Manual stating the tuition payment or reimbursement policy of that company.

At the end of the semester, the student is responsible for requesting that the CSIS Program Coordinator to prepare a letter to the company stating the course completed during the current semester and the grade received for that course. Payment from the company

is due no later than 15 days after the beginning of the following semester. The student is responsible for any amount not covered by the company. This amount should be paid at the beginning of the semester. If the student cannot cover the cost at the beginning of the semester, a Promissory Note must be signed by the student indicating a specific date before the end of the current semester when the balance will be paid.

Any questions regarding payment of tuition should be directed to the Program Coordinator in the Department of Computer Science and Information Systems, located in the Ann & John Clendennin Computer Science building, or telephone 770-423-6005.

E. KSU Tuition Stipend Policy

KSU Faculty and staff who participate in the MSACS program will be receive a stipend of \$904 per semester. The individual will be responsible for the remaining balance of out-of-pocket expenses.

F. KSU MSACS Graduate Assistants

Graduate Assistants (different from Graduate Research Assistants) receive a \$2000 stipend per term for approximately 13 hours of work per week over a 15 week semester

G. KSU MSACS Graduate Research Assistant Tuition Remission

The MSACS has a very limited number of Graduate RESEARCH Assistantships available. GRAs receive a \$2000 stipend per term for approximately 13 hours of work per week over a 15 week semester. In addition, GRAs also receive a partial tuition waiver for each term they are employed as a GRA. GRAs work closely with graduate faculty on research projects.

H. Board of Regents Policy for Individuals 62 Years Old and Over to Attend Free Classes

The BOR policy for individuals 62 years old and older to attend free classes does not apply for premium professional programs. Instead, individuals in this age bracket will have tuition and fees waived according to the

policy for tuition remission for KSU employees stated above. The individual will be responsible for the remaining balance of out-of-pocket expenses.

I. Refund Policy for Withdrawing from Classes

The following refund policy is in effect:

- A. Students withdrawing within the first two weeks during which classes are held each semester, will receive a 70% refund less expenses already incurred.
- B. Students withdrawing from classes after the first two weeks but prior to or on the "last day to withdraw from classes" of a semester of classes will receive a 40% refund less expenses already incurred.
- C. Students withdrawing from classes after the "last day to withdraw from classes" will receive no refund.

MSACS students are responsible for notifying the Director when they plan to withdraw from the program. A withdrawal Form must be filled out, signed by the student and delivered to the Registrar's Office before a student is officially withdrawn from the class. A copy of this form and accompanying letter are sent to Student Accounts.

Foundation Courses

Students lacking formal preparation may be required to complete one or more of the following computing foundations courses. These courses are designed to provide an individually tailored program of study in computer science foundations, and will be delivered in an online self-study format. The prerequisites for these courses are program admission.

CS 8001 Computer Hardware 1 Hour

A study of basic computer hardware components and devices including floppy and hard disk drives, monitor technologies, printers, digital scanners and cameras, optical storage devices, backup devices, raid technology, Intel and AMD processor generations. The course will also discuss the differences (and similarities) between workstations, PCs, mainframes, servers, and supercomputers.

CS 8002 Computer Networking 1 Hour

A study of basic networking methods, topologies, devices and technologies.

CS 8003 Elementary Data Structures 1 Hour

A study of elementary data structures including arrays, lists, and trees, along with simple methods for sorting and searching.

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Credit Hours

REQUIRED TRADITIONAL COURSEWORK **30**

CS 8421	Computing Systems	3
CS 8422	Advanced Computing Systems	3
CS 8431	Software Engineering	3
CS 8532	Advanced Software Engineering	3
CS 8411	Embedded Systems and Micro-controllers	3
CS 8512	Advanced Embedded Systems and Micro-controllers	3
CS 8625	High-Performance Computing	3
CS 8628	N-Tier Client-Server Systems	3
CS 8630	Database Administration	3
CS 8635	Distributed Object Technology	3

Applied Studies **6**

Students will complete hours of study of current applied computer science topics, including seminars and lectures as part of the Distinguished Speaker Lecture Series, a Special Topics course of study (LINUX or ORACLE certification).

CS 8910 Professional Seminar	3
CS 8990 Special Topics	3

MSACS Distinguished Speaker Lecture Series. Three hours of CS 8910 Professional Seminars over three semesters.

Applied Project or Professional Certification CS 8990 Special Topics: Students tailor part of their education by designing a 3-hour project course. Students may elect to work on a professional certification program in UNIX or ORACLE, or students may choose to design an applied research project working closely with a faculty sponsor. An applied research project required a formal project proposal and plan, and must be approved by a faculty sponsor and by the program director.

PROGRAM TOTAL: 36

MSACS Course Descriptions

CS 8001. Computer Hardware. 1-0-1.

Prerequisite: Admission to the MSACS program.

A study of basic computer hardware components and devices. Topics include storage, monitor technologies, printers, digital scanners and cameras, optical storage devices, backup devices, raid technology, processor generations, workstations, PCs, mainframes, servers, and supercomputers.

CS 8002. Computer Networking. 1-0-1.

Prerequisite: Admission to the MSACS program.

A study of basic networking methods, topologies, devices and technologies.

CS 8003. Elementary Data Structures. 1-0-1.

Prerequisite: Admission to the MSACS program.

A study of elementary data structures including arrays, lists, and trees, along with simple methods for sorting and searching.

CS 8411. Embedded Systems and Microcontrollers. 3-0-3.

Prerequisite: Admission to the MSACS program.

An introduction to embedded systems, embedded systems programming, microcontrollers and embedded system analysis and design. Discussion of real-time systems, operating systems, timing constraints and execution size limitations. Laboratory experience will realize theoretical concepts.

CS 8421. Computing Systems. 3-0-3.

Prerequisite: Admission to the MSACS program.

This course is the first in a sequence of two required core courses building a high level of competency in computing systems. The sequence builds content in the following knowledge areas: architecture performance enhancements, advanced computer architectures, data communications, networking protocols. Topics include caching, pipelines, super-scalar architectures, multiprocessors, multi-computers, networking, network protocols, and Internet protocols. Includes a review of basic computer architecture.

CS 8422. Advanced Computing Systems. 3-0-3.

Prerequisite: CS 8421.

This second course in the sequence continues the study of computing systems concentrating on networking and operating systems and covers distributed and networked systems. Topics

include CPU time management, memory management, storage management, process control, synchronization and deadlock, distributed operating systems, data communications, networking protocols, distributed systems, distributed cache coherence.

CS 8431. Software Engineering. 3-0-3.

Prerequisite: Admission to the MSACS program.

Techniques and formal methods in modern software design and engineering. Coverage of UML, design patterns and frameworks.

CS 8512. Advanced Embedded Systems and Microcontrollers. 3-0-3.

Prerequisite: CS 8411 and completion of CS 8001, 8002, 8003.

A continuation of Embedded Systems, with emphasis on interfacing, networking, and real-time systems analysis and design.

CS 8532. Advanced Software Engineering. 3-0-3.

Prerequisite: CS 8431 and completion of CS 8001, 8002, 8003.

A study of the use of simulation in the design and verification of complex software systems, specifically including real-time systems with hard timing constraints.

CS 8625. High Performance Computing. 3-0-3.

Prerequisite: CS 8628, CS 8422, CS 8512.

A study of high-performance computing systems and architectures, programming techniques, theoretical and practical parallel speedup alternative mechanisms and limitations. Include a brief introduction to Quantum Computing principles and projected application.

CS 8628. N-Tier Client-Server Systems. 3-0-3.

Prerequisite: CS 8630.

A study of modern N-Tier Client Server systems that form the foundation for distributed computing systems. This course dovetails with the software-oriented orientation of CS 8635 Distributed Object Technology. Integrated topic spanning computer architecture, networking, middleware, operating systems, client-server system design.

CS 8630. Database Administration. 3-0-3.

Prerequisite: CS 8422.

An introductory course in database administration. Students will learn database theory, with hands-on applications.

CS 8635. Distributed Object Technology. 3-0-3.

Prerequisite: CS 8628 and CS 8532.

A presentation of Networks, UNIX and programming including inter-process communication, communication protocols, OSI mode, security, file transfer protocols, printer spoolers, remote command execution, remote login/access, performance and procedure calls.

CS 8910. Professional Seminar. 1-0-1.

Students will complete three hours of CS 8910 Professional Seminar.

CS 8916. Coop. 3-0-3.

Prerequisite: Permission of Program Director.

Students may receive credit for coop and internship work through this course.

CS 8918. Internship. 3-0-3.

Prerequisite: Permission of Program Director.

Students may receive credit for coop and internship work through this course.

CS 8940. Directed Study. 1 to 3.

Requires permission of the Program Director and a faculty sponsor/mentor.

CS 8990. Special Topics. 1 to 3.

Prerequisite: Permission of Program Director.

Current topics in applied computer science, offered on an as needed basis.

